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NERYUNGRI GRES PROGRESS REPORT

Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 4 Feb 82 p 3

/Article by O. Kvyatkovskiy, correspondent for the newspaper STROITEL'NAYA GAZETA on the Far East, special for KAZAKHSTANSKAYA PRAVDA, Yakutskaya ASSR: "Pearl of the BAM"/

/Excerpts/ The southern shore of Yakutia is densely covered by the blue fabric of the tayga, undulating slopes and mountain peaks. Here right up to the present day we find the youthful cover of the planet.

The modern industrial center is spread out here in its own way in a sharp and impressive way.

In the Yakutsk museum rests a wooden pancake. The cross-section of the first pinetree to be planted in the city of Neryungri. An exact date is inscribed on it - 15 July 1975. Only seven years have passed since work first began on the Southern Yakutia territorial-production complex (TPK). And no matter how accustomed we become to the pace of the twentieth century, the speed with which the complex is being created never fails to astound us.

Only from an altitude of one kilometer can one in a glance take in everything that has within a very short period of time come to be called Neryungri. Having removed the lofty cap from the mountain, they uncovered what they desired - a stratum of coal. From the hill overlooking the coal deposit one can see the yellow giant dumptrucks (with wheels as high as a two-storey house), which have been loaded with as much as 180 tons of the fuel, as they proceed in a fantastic cavalcade into the thick of the enormous unified construction site. There the rails, like the veins swollen in a tensed arm, lead out to the little BAM with the third million tons of the Neryungri "hematogen of the planet". There rise the red ribs of the ore enrichment plant and the platform of the GRES foundations as wide as a soccer field. There the new city is underway near Siniy Bor on the top of the mountain.

The Neryungri construction project is an undertaking of the future. This external similarity must very soon be reflected in the economic indicators of the TPK. This is precisely what it says about this in the decisions of the 26th Party Congress: "to continue the formation of the Southern Yakutia TPK, to complete the construction of the coal mine, the ore enrichment plant and the first section of the Neryungrinskaya GRES."

The TPK, which is the first near the railroad line from Baykal to the Pacific Ocean, is called the "pearl of the BAM". Ash coal and coke, iron ore, druse, and mica are the first pathways leading into the interior of the expanses of the southern portion of the Yakutskaya ASSR. The difficult experience in creating the first BAM TPK will become a long-term natural orientation for the future. The difficult school of Neryungri is being attended by the organizations of many all-union departments and ministries. However, the outcome and price of the pearl of the BAM depends entirely upon the actions of the builders.

During the past five-year plan, 1.3 billion rubles have been spent here. Here everyday at all construction undertakings of the complex a million rubles worth of construction and installation work is completed - the reference point for the present five-year plan is two billion rubles.

Ivan Ivanovich P'yankov, the first secretary of the Neryungri Party Committee, confidently reports, "the costs will be recovered a hundred times over. The geologists estimate that there are more than 40 billion tons of coal here and more than 7.5 billion tons of iron ore. The deposits are located within a radius of 100 kilometers, meaning that they are practically on top of each other. Our construction subelements are now building a road to these deposits. These subelements include the Yakutuglestroy /Yakutia coal mining construction/ combine and the Neryungrigresstroy /Neryungri GRES construction/ administration. But you are visiting all of the main construction sites, so see for yourself...."

The Southern Yakutia TPK was conceived on a large scale, taking into consideration the many lessons learned at other large construction projects. The builders were not dropped into Neryungri as if on an unihabited island; they came here on tested and smoothed paths: they were received by the airport in Chul'man and they are only 500 versts /533.5 km/ from the Bol'shoy Never branch of the AYaM - the Amur-Yakutia Highway. The rails of the BAM reached Yakutia ahead of schedule. In a word, the transport problem did not affect the construction project here as much as it did, for example, in Tyumen'. From the very beginning the complex was well supplied with water, electricity and heat. The Yakutuglestroy combine, the main general contractor, had access to the equipment required to fight against the permafrost and other caprices of the climate and terrain; in other places they did not even know about such equipment. As early as 1975 (recall the pancake in the museum) the city began to take shape with a large and reliable supply of heat.

The complex for processing the coking coal, capable of processing nine million tons per year, must be put into operation in 1983. The facility is the primary muscle and nerve of the TPK. But it is no easy matter to give it force and life - there is nothing like it in the USSR.

For example, the Soviet Union has never attempted to use a coal drying system in a boiling layer. Never before have raw materials been prepared for export conditions in so many complicated displacements and conversions. Moreover, automation is almost 100 percent. And the quality is of the very highest, for which a large chemical laboratory is being built. The documentation for the construction work on just the drying-furnace building involves some 40 enormous volumes.

The director of the mill that is being built, G. Gladyshev, says, "nearly 2,000 builders and installers are working on this key project. Our chief problem is how best to organize our labor in conditions of closeness and the scarcity of many structures..."

An example of skilled and highly-productive labor was greatly needed here. Now we have such an example - the collective of the specialized sector for the construction of silo warehouses fulfilled last year's assignment three months ahead of schedule.

We viewed the "economic unit" of Vladimir Kurchikov's brigade. He attempted to show everything without concealing anything, but it was clear that it would take more than a day or two to become thoroughly familiar with his work. The light gray towers loomed large in a dense row - the storerooms for coal with a diameter of 28 meters and a height of 62 meters. Kurchikov's brigade must erect seven such towers - each requiring a thousand cubic meters of reinforced concrete and 560 tons of metal structures.

The brigade leader says, "the time has come to pour the concrete for the storage towers. The design calls for a continuous structure, but we have advised the customer to use a porous structure. In addition to reducing the amount of time required for the work, we are saving 400 cubic meters of concrete in each warehouse. They scared us, saying where are you going to get the special forms. Nowhere. We made them ourselves..."

If the coal enrichment facility in Neryungri is a beacon, the new GRES is the beachhead and foudation of the entire project. It can be said bluntly that this is an impressive foundation - 700 hectares are involved in the site of electric power station. The start-up of the first power unit, consisting of a steam boiler capable of producing 670 tons of steam per hour and a turbogenerator with a rated capacity of 200,000 kW, is to take place in 1983. This is not very much time, particularly when the settlement of Serebryanyy Bor and several auxiliary facilities must also be built at the same time.

One other Neryungri project is unique. A reservoir for 50 million cubic meters of water is being built, in which the water does not freeze at 60 degrees below zero. A mountain stream is being closed off and a 27-meter high dam is being built following the example of the Vilyuy hydroelectric power station builders, who were the first in the Soviet Union to assimilate the technology for erecting such facilities in permafrost conditions.

Everyone involved in the Southern Yakutia affairs deserves special recognition. But in Neryungri no one will ever forget the name of the first owners, who were responsible for the appearance on the earth of the city. A special place in the first rank is forever devoted to the brigade leader of the housing builders, Anatoliy Petrovich Plantonov.

The situation in the city itself has long hindered all work on the TPK. The departments, which started the new undertaking, were initially only interested in coal. And they forgot about people. In place of the city, warm and comfortable, an innumerable number of "khalabudki", gullies and other shelters, which can scarcely be called housing, were scattered throughout the valley. The turn toward a modern city did not happen all at once. But life itself finally led in this direction: the enormous construction project was without workers. It was not only necessary to build a city now, but to build it quickly as fast as possible and in so doing to preserve a good quality and beauty.

The construction of wooden houses proceeded quickly, carefully and with extra concern for even the simplest assignment. And when, finally, in Neryungri, swamped with the entire construction undertaking, a large panel "100,000" housing plant was created, it was Anatoliy Petrovich Platonov who was in charge of the brigade that was to construct the latest series of houses in Yakutia.

Last year alone Platonov gave the city of Neryungri 400 apartments in the long-awaited housing units. Now there is no doubt but that he will provide even more. On the agenda in Neryungri is the creation of a housing construction combine. Practically speaking, Platonov's collective is already a large self supporting sector, which, by the way, they call "boss number one" in Neryungri.

At the wooden, drafty airport terminal in Chul'man, I said goodbye to Yakutia. For two days I watched the weather here, again and again recalling this distant, severe and remarkable kray of the Soviet Union. I was already beginning to miss it and to prepare for a return visit. Finally, a window opened in the low clouds, and the airplanes began landing, resembling the leaves of the acacia trees. And the new settlers, burdened with suitcases and children, placed their feet on Yakutia soil.

They come here from various places. After all, the Far East, as no other place in the USSR, brings out all of the best characteristics of man: strength of spirit, patriotism and the desire to succeed.

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ELECTRIC POWER

ALTAYENERGO REPORT: PUTTING POWER INDUSTRY RESERVES TO WORK

Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 10 Feb 82 p 1

/Article by P. Shchuplov, correspondent for the newspaper KAZAKHSTANSKAYA PRAVDA: "Putting Power Industry Reserves to Work: Knowing How to Count and Expend"/

/Text/ The collective of the Altayenergo Association is taking steps to more fully meet the needs of the electric power consumers and to help the production collectives to increase the output of non-ferrous, precious and rare metals, machinery and machine tools, automation instruments, and other kinds of product. Last year the hydroelectric and thermal electric power stations of the association produced an additional 143 million kilowatt-hours of electricity and 48,600 Gcal of thermal energy.

The dominance in the competition is firmly supported by the collective of the Ust'Kamenogorskaya TETs. The boilers and turbines here operate without stopping at full capacity; and the efficiency of the primary equipment is improving. In January of this year the power station overfulfilled its plan for the generation of electricity.

The efficiency of the assemblies has been significantly increased by the collectives of the Leninogorskaya, Sogrinskaya and Semipalatinskaya thermal electric power stations. They have provided a great deal of electricity in excess of the plan. In the first days of February, the actual capacity of the Ust'-Kamenogorskaya TETs increased by 6,000 kilowatt-hours and the Semipalatinskaya TETs by 4,000 kilowatt-hours.

Unfortunately, the same cannot be said about the Bukhtarminskaya and Ust'-Kamenogorskaya hydroelectric power stations, where the generation of electricity is dropping. In recent years power output has dropped almost 1.5-fold.

The director of the Altayenergo Association, V. Khorokhov, explains, "this indicator depends largely upon the water level. The Bukhtarminskoye reservoir has become shallow. There is less water pressure, which has meant a drop in power generation."

The problem is that the Pavlodar-Ekibastuz power complex, which is in serious debt to the Rudnyy Altay, is not doing a good job of transferring electricity. Things have gotten so bad that the shops of the leading mining and metallurgical enterprises of the Eastern Kazakhstan are experiencing disruptions in the supply of electricity; sometimes they are simply shut off from the power supply. For this reason there is a drop in the output of valuable product. The management of the Ust'-Kamenogorsk lead-zinc and titanium-magnesium combines, the Leninogorsk poly-metal combine, the Zyryanovskiy lead and Belogorskiy mining and enrichment combines, plants, and other enterprises complain about the frequent disruptions to electric power.

These problems can be solved in two ways: by increasing the generation of electricity and making rational use of local power resources. A good example of thrift is being set by the metallurgists of the Ust'-Kamenogorsk lead-zinc combine. All smelting and roasting furnaces here have been switched to evaporation cooling; in the shops recovery units have been installed to more fully use and recycle fuel. In proceeding in this manner, the combine last year conserved 60,000 tons of conventional fuel.

The metallurgists of the Ust'-Kamenogorsk titanium-magnesium combine know how to keep track of power resources. In recent years alone the foremen of the "winged product" have reduced the amount of electricity expended for the production of one ton of titanium by 3,000 kilowatt-hours; and the poly-metal workers have reduced the total consumption of energy by 11 percent while increasing the output of commodity product by hundreds of thousands of rubles.

Unfortunately, things are not the same everywhere. At the Zyryanovskiy lead combine, for example, last year they overexpended 8.7 million kilwatt-hours of electricity. At the mines and ore enrichment plants emergencies are permitted to develop; energy-intensive equipment often operates with a small load. Energy resources are used irrationally at the East Kazakhstan copper-chemical combine, the "Rassvet" sewing association, the Leninogorsk brick plant, and at other enterprises within the oblast. The annual consumption norms at the Leninogorsk brick plant were exceeded by more than 2-fold.

Large savings for the enterprises come about as the result of the collectives' struggle to raise the level of compensation for the reactive capacity of the power units. Specialists have estimated that just by doing this at the Zyryanovskiy lead combine it would be possible to reduce the expenditure of electricity by one million kilowatt-hours; and similarly, the Altaysvinetsstroy trust could save 210,000 kilowatt-hours, and the instrument plant could save 75,000 kilowatt-hours.

The extensive use of recycled power resources, strict observation of economizing measures at industrial enterprises of Rudnyy Altay will help to increase the output of product while reducing the amount of fuel and electricity needed for this.

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PROGRESS REPORT ON ROSTOVSKAYA AES

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 10 Feb 82 p 1

/Article by V. Nevskiy, chief of the All-Union Production Association Soyuzatomenergo: "The Rostovskaya AES"/

/Text/ On the left shore of the Tsimlyanskoye Sea several kilometers from the spacious, multistorey buildings of the new Volgodonsk, a large construction project has gotten underway. In the near future the buildings of the Rostovskaya atomic electric power station will be going up. At the end of the current five-year plan its first power unit with a rated capacity of one million kW is to feed current into the USSR's national power grid.

The role of this power station is to be special. Its output will make it possible to substantially improve the supply of power for the entire Northern Caucasus and, consequently, speed up the pace of the economic development of this region.

What is so interesting about this future AES? First of all, the fact that it is not unique. Until recently each AES was unique, unlike its predecessors; each was built according to an individual design. But the Rostovskaya AES is being built according to a standard design and will be an exact copy of the Zaporozhskaya AES (the lead AES in the series), the Balakovskaya AES and several others. This means that it will be one of the first achievements of a qualitatively new stage in the development of the atomic power industry of the Soviet Union - the stage of the flow-line, series construction of standard atomic power stations.

The requirements for quality of designs and their real embodiment in the atomic power industry have generally been raised - and in this case they have been raised doubly: to determine the circulation of unsuccessful solutions - what can be more disadvantageous? For this reason, it is felt, the labor of the designers from the Gor'kiy department of the Teploelektroproyekt Institute, who developed the documentation for this project, will receive high marks.

In addition to the high technical-economic characteristics, the standard AES is distinctive for its nearly sterile ecological cleanliness. Everythingis estimated to reduce the harmful effects of the power station's operation upon the environment to zero. It is sufficient to say that nearly one tenth of the money allocated for the construction on a target basis was earmarked for the creation of "mechanisms" to protect the environment.

The power station will be fed by its own reservoir-cooler, which has been set apart from the Tsimlyanskoye Reservoir by an 11-kilometer dam. Naturally, they could have gotten by without the dam. But this measure was justfied: in this manner the power station receives the needed independence from the variations in water level in the Tsimlyanskoye Sea, which is connected with the operation of the hydroelectric power station, the amount of flooding and the changing amount of water in the Don River.

An interesting and important detail: the Rostovskaya AES will be a comprehensive enterprise. While generating its primary product of electricity, the station will also be a large supplier of thermal energy for the needs of the city of Volgodonsk and its industrial center.

At the site of the future AES the Volgodonskenergostroy builders, who are erecting at a rapid pace the giant of the power machine building industry, Atommash, are now taking only the first steps. The administration for construction of Atomenergostroy, which was specially created for this project, is in charge of the ground clearing work. Speaking bluntly, the collective has yet to reach the needed pace of work.

The delay at the start, of course, is cause for alarm in our Soyuzatomenergo Association, which is the customer, and in the Volgodonskenergostroy and the Glavzavodspetsstroy of the USSR Ministry of Power and Electrification. However, to say that the time has been lost forever would be inaccurate. The difficulties of the initial work period are to be expected. But now it is important to do the construction and installation work along a broad front and in strict technological sequence.

One wants to believe that this year the builders will with honor fulfill the assignment called for in the plan. A good argument in the solution of this task must be the method of long-term flow for them, the technology of which is being developed presently in the construction of the Zaporozhskaya AES. To save time and money will also be helped by the extensive standardization of construction structures and their flow-line manufacture in special shops of the industrial base of the builders of the Rostovskaya power station and the Zaporozhskiy atomic power station construction combine. Estimates suggest that these and other measures will make it possible to reduce the cost of construction by approximately 700,000 rubles as compared with the estimated design cost.

From the editors: In representing the Rostovskaya AES to the readers, the editors announce that the newspaper intends to continuously monitor this construction project. For this purpose, a permanent correspondent post has been created at the construction site of the power station.

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ELECTRIC POWER

EKIBASTUZ - SYMBOL OF ENERGY PRODUCTION IN KAZAKH SSR

Moscow PRAVDA in Russian 14 Apr 82 p 2

/Article by V. Afanas'yev: "Kazakhstan - Grain and Energy"/

/Excerpts/ A great deal has been very well written about grain. And it could not be otherwise: although man does not live by bread alone, it is very important to his well-being. And this is not just because there is nothing to take its place. A great deal of labor, a love of land and the most difficult mission of the grain growers are required to put the fragrant, light loaf on our dinner table. Grain is the might and authority of the Soviet Union, a symbol of the well-being and success of the people.

Energy is similar to grain. One of its main sources is coal, which is called the bread of industry. Oil is called black gold and natural gas is called blue gold, although gas is colorless and coal is not exactly black. Still, just as we cannot get by without bread, a modern economy cannot get by without energy. For the economy energy is an irreplaceable source of existence and development. The level, pace, volume and direction of the movement of production, the progress of science and technology, and public production on the whole to a large extent, if not to a decisive extent, depend upon the amount of energy obtained and consumed by society.

Grain and energy, energy and grain - two cornerstones of modern man's existence.

Our great nation, the Union of Soviet Socialist Republics, which soon will celebrate its 60th anniversary, is rich in resources and human spirit. It is amply supplied with both grain and energy, although they both require enormous efforts.

A great deal of grain and energy are the objects of pride for the Kazakh SSR. The virgin lands are the symbol of Kazakh grain and Ekibastuz the symbol of its energy.

As has already been noted, Kazakhstan provides the Soviet Union with a great deal of grain and energy. We were convinced of this when we visited Ekibastuz, the center of a new fuel and energy complex.

Decisions of the 26th Party Congress call for the creation near Ekibastuz of four GRES's with a rated capacity of four million kW each. This gigantic electric power system is unlike any other that has been created within the USSR.

At present the Party decisions are becoming a reality. Four of the eight power units at GRES-1 are already operating and providing the Soviet Union with electricity. Half of the first four-million kw capacity system of the four are ready, or to be more precise are almost ready (as to why we say "almost", we will explain later). Construction on GRES-2 is now underway, although not at the pace one might hope for.

From here gigantic flows of energy will be directed to the Center of the Soviet Union, to the Urals, Siberia, the Altay and to the south of the Kazakh SSR. The LEP-500 from Ekibastuz to Barnaul is being built at a rapid pace. In the current five-year plan the first section of the high-voltage power transmission line with a direct current 1,500 kV will be put into operation between Ekibastuz and the Center; and alternating current power lines with 1,150 kV will be completed between Ekibastuz and the Urals.

By the way, this is the first time that such a powerful power transmission using direct current has been built in the Soviet Union. On this line as compared with an alternating current LEP considerably less power will be lost "enroute".

Great importance to the further development of the Ekibastuz fuel and energy complex was provided in the decree of the CPSU Central Committee and the USSR Council of Ministers, which concerned "additional measures for speeding up the development of coal extraction using the open pit method in the years 1981 through 1990" (October 1981).

While visiting the Ekibastuzskaya GRES-1, we were surprised by its size and scale of the building itself - it is hundreds and hundreds of meters in length. And the smoke stacks are very high (330 meters). We were also amazed by the high degree of automation. Two operators and a shift chief (three men altogether) run the power station's two power units using very intelligent machines. It seems impossible that only three persons could run the station in the vast machine room with countless instruments, indicators, and guages. The men are barely noticeable amidst the vast array of automated equipment.

This is not to imply that there are few people at the power station - there are nearly 2,500 people there. But they have quite different functions: to create for those in charge of producing power (three per each of the four shifts) conditions that will ensure no disruptions in the generation of electricity. The power station is an extremely complicated organism, it must be maintained properly and the

people who work there must have the most pleasant conditions for working and relaxing.

Within the collective of the power station there are 253 communists. In general this is not many, only one tenth of the total. K. A. Adilov, the secretary of the GRES-1's Party Committee, notes that the communists are in the front ranks of those who are assimilating the power station and that there are quite a few of the non-party workers who deserve to be called communists. Thus the party organization is growing and will continue to grow.

We do not intend to conceal the fact that the GRES-1 is not working smoothly and that there are disruptions. One power unit after another malfunctions. The reason for this is primarily that there are a large number of defects in the equipment, which is manufactured by enterprises in the cities of Khar'kov, Leningrad, Novosibirsk, Barnaul and others. The station also has its own shortcomings and miscalculations. After all it is still young and is still in the formative stage and things still need to be adjusted properly.

A. P. Mokshin, the general director of the Ekibastuzenergo Association, says that the formation of an amicable, cohesive and skilled collective is his primary goal.

Judging from everything, the power station collective is strong. It has already achieved great success. On 26 March the "A" watch, headed by engineer V. G. Busygin, brought the existing two power units to the designed level - two million kW. And this took place in spite of the fact that the fourth unit has not even been formally accepted: there are still a large number of unfinished tasks and other problems. However, this one day's success provides evidence of the collective's enormous possibilities and that the designed capacities can and must be assimilated.

Quite a few advanced methods are being used in the construction of the Ekibastuz GRES's: the flow-line method where several units are erected at the same time and the large preassembly of units. Experience is being accumulated. As a result the pace of construction is picking up. Thus, the fourth power unit was erected twice as fast as the first.

At the same time there are quite a few problems here. The biggest problem is the delay in constructing the infrastructure. The railroad line from the coal mine to the power station is operating on a temporary, very unreliable schedule. Essentially the power station does not have storage facilities for the coal, which does not make it possible to create needed reserves and to operate without reserves is very risky. The construction of housing and cultural and services facilities is behind schedule.

The housing shortage makes it impossible to create the needed repair service, without which it is the same as not having enough workers. There are workers and brigades from the manufacturing plants are eliminating the defects in the equipment. But these are temporary people who live at the power station for about two months, take care of the defects and then return home. But such a complicated organism as a four million kW power station needs its own repairmen and adjusters. One cannot rely upon brigades from far off each time there is a minor problem (and they cannot be avoided). The power station must have its own people living nearby, who are ready to take care of problems immediately. However, there is no place for them to live.

There are no words, the city of Ekibastuz is growing rapidly and 50,000 square meters of housing is being built every year. But this is very little. Ways must be found to speed up the development of the social infrastructures and to bring it into allignment with the growth rate of the energy capacities.

The general contractor for the construction of the GRES cascade in Ekibastuz, the USSR Ministry of Power and Electrification, and the general customer, the USSR Ministry of the Coal Industry, are responsible for the fact that there are defects in the equipment and that the development of the infrastructure is proceeding slowly.

The question arises: where will the fuel, the coal which provides life to the cascade of the four million kW stations, come from? After all, the first four power units of the GRES-1 alone are burning tens of thousands of tons of coal every twenty-four hours.

And the coal is readily available, only 20 kilometers from the GRES. The coal is in the Ekibastuz coal basin, one of the largest in the Soviet Union. The incredibly enormous coal vein weighs nearly 14 billion tons. There is enough coal to meet the needs of the four Ekibastuz power stations for a hundred years. And not just the Ekibastuz power stations: more than 20 large thermal electric power stations in Siberia, the Urals, and the Kazakh SSR use Ekibastuz coal. Every day the Ekibastuzugol' Association ships 3,000 railroad cars of fuel from its mines. Coal is extracted by the open mit method here. It is the cheapest coal in the Soviet Union. This is easily understood: to extract a cubic meter of coal it is only necessary to remove a half cubic meter of rock.

I visited the largest coal mine in the Soviet Union and in the entire world - the Bogatyr' mine. This truly gigantic mine produces 50 million tons of coal per year. It is a remarkable sight and the landscape is of cosmic proportions. Coal is extracted in an immense trench and all around it are gigantic mountains of the rock that has been removed from the coal vein. Powerful mechanisms - rotor complexes, the most powerful of which produces 5,000 tons of coal per hour - look upward like the pencils of schoolchildren. You are seized with pride when you recognize that these giants have been produced in the Soviet Union. The Japanese "3,000-ton" units look small

by comparison - pencil stubs rather than pencils. And the "1,000-ton" units look like match sticks. By the way, these "match sticks" are now being replaced by "pencils".

It is well known that Ekibastuz coal contains a great deal of ash (as much as 30 to 35 percent) and that it is not economically feasible to transport it over great distances. In actuality: what good does it do to transport ballast, ash? This is why it was decided to transport energy rather than coal. The energy is produced locally in Ekibastuz. This is much more economical and ecologically sound. Economical because it does away with the need to transport coal in countless numbers of railroad cars, which is particulary important at a time when railroad cars are in short supply. It is ecologically sound because the enormous masses of ash will not spoil the earth's surface.

And what about the Ekibastuz ash? Where can it be hidden? A rather rational solution to the problem has been found. The ash pulp is released into the "dead" Karasar salt lake, which can for approximately 50 years accept the remnants of coal burning in Ekibastuz.

Kazakhstan has received four medals: two orders of Lenin, and the Order of the October Revolution and the Order of Friendship of Peoples. Behind each of these awards are the enormous efforts, the successful and frequently selfless labor of its workers, kolkhoz workers, specialists, scientists, Party and soviet workers.

Kazakhstan, as noted at the 26th Party Congress, "is living through a period of a true flowering of its economy and culture. In the 10th Five-Year Plan alone more than 250 modern industrial enterprises, large shops and production facilities were put into operation here. The Kazakhstan billion poods of grain is becoming common, which when combined with the grain of the RSFSR and the Ukrainian SSR form the basis of the Soviet Unions food supply." Last year Kazakhstan fulfilled the plan for the procurement of sugar beets, cotton and several other crops. Purchases of milk, meat, wool, and eggs increased. And the production of rice is increasing.

Kazakhstan is not only praiseworthy for its earthly virgin lands but for its space virgin lands as well. From Baykonur the first cosmonaut, Yu. A. Gagarin, and his successors were launched into space.

Everything that has been said about Kazakhstan does not mean that everything is good in the Kazakh SSR, or that there are no shortcomings, difficulties or problems. They do exist and they are aware of them and discuss them openly and frankly.

I was convinced of this after visiting the Central Committee Plenum. In the report, the debates, and in the speech of the first secretary of the Central Committee of the Kazakh SSR Communist Party, D. A. Kunayev, a speech of self-criticism and of defining the problems, there was not a hint of complacency. The communists talked not only of the present, but of the future, and of the tasks, opportunities and prospects. These are complicated tasks; the opportunities are great; and the prospects are optimistic.

ELECTRIC POWER

NUREK GES DESCRIBED

Tashkent STROITEL'STVO I ARKHITEKTURA in Russian No 12, Dec 81 pp 23-25

/Article by I. G. Reznikova, architect, and I. P. Pomazuyeva, engineer, Sredazgidroproyekt /Central Asian Hydroelectric Power Station Design Institute/: "The Nurek Hydrosystem: What Will It Be Like?"/

/Text/ Construction work on the Nurek hydrosystem on the Vakhsh River in the Tajik SSR is now coming to an end. This is a large power and water management complex with a dam poured from local materials (loam, coarse gravel, and rock). The height of the dam is 300 meters. The dam encloses the rather narrow Puli-Sanginskoye ravine, forming a deep reservoir containing 10.5 billion cubic meters of water. The pressure created by the dam is used to generate inexpensive electricity at a hydroelectric power station with a rated capacity of 2,700,000 kW. The seasonal regulation of the flow of the Vakhsh River by the Nurek reservoir makes it possible to improve the irrigation conditions below the hydrounit and within the basin of the Amudar'ya River.

The great importance of the Nurek hydrosystem in the national economy places corresponding demands upon its architectural appearance. The dam of the hydrosystem, the hydroelectric power station, and the tunnel-type spillway structures are located in complex topographical and geological conditions. The sites for the main structures, the roads, and for organizing the quarries were literally won back from the mountains that come up to the Vakhsh River.

Now when the dam and the hydroelectric power station building have been erected and the spillways are comfortably placed in the channel of the Vakhsh River, it is difficult to imagine the difficulties encountered by the builders during the construction process. So that visitors to the Nurek hydrosystem can appreciate both the virtues and the scale of the labor invested in the construction, the Gidroproyekt Institute has decided to provide convenient points from which to examine the facilities. They have combined these points with a display of exhibits from the history of the hydrosystem's creation. For these purposes, three viewing sites are to be built.

From the first site, which rises above all facilities on the steep shelf of the left side, a panorama opens that takes in the turquoise surface of the reservoir, the crest and the lower edge of the dam, the building of the hydroelectric power station and the site adjacent to the station, the end sections of the tunnel spillways on the left shore, and the city of Nurek. The city is situated on the right hand side of the Vakhsh River. On the left shore of the river, opposite the central portion of the city, there is a view of the lake that has been formed in the spot where the quarry was dug. At present Sredazgidroproyekt is working on designs for the creation of a rest and relaxation area around this lake. The city and the structures of the hydrosystem are linked by a highway that encircles them. Special stands installed on the viewing site acquaint the visitor with the overall layout of the entire complex of the hydrosystem's structures, including the tunnel structures.

The second viewing site will be the place to begin the examination of the hydrosystem, since it is being installed on the right-hand shore as you enter the area of the hydroelectric power station. Here there will also be a parking area for automobiles. By cutting through the so-called "salt dome", which previously made it impossible to see the power station, an area is formed which makes it possible to display in the open terraces the equipment that was used in the construction work. There is also room for an exhibit of the history of the construction. The third viewing site is located on the right-hand shore above the second site, providing an even larger overview of the area.

The external appearance of the basic structures of the hydrosystem is executed laconically. The crest of the dam is 800 meters in length and is accentuated by a reinforced concrete blank parapet with a row of lamps along the side of the tail water. On the slope of the upper portion of the dam in coordination with the extruding concrete elements of the earthquake-proof belt a severe ornament of reinforced concrete slabs placed along the slope is created. On the side of the tail water the dam is divided vertically by a row of horizontal berms. Along the berms there is a broken guardrail made of reinforced concrete elements. From the direction of the reservoir the crest of the dam is accentuated by a blank parapet. The color of the dam is based upon combining the dark red stone of the body of the dam with the light gray concrete elements.

At the base of the dam, joining both shores of the Vakhsh River, is located the building of the hydroelectric power station. The facade of the building with a total length of nearly 230 meters faces the approach to the hydrosystem. The vertical segmentation, which is formed by buttresses and inter-buttress apertures, makes the facade of the hydroelectric power station easily seen from a great distance. The line of the hydroelectric power station's facade is closed on the right-hand shore by the administration building, which is a 5-story structure with vertical segmentation along the surfaces of the facades. The entrance and the first story are separated from the basic volume of the building by a portal. The vertical elements of the administration building, the portal and the wall are faced in white marble. The piers are a sky-blue color.

The area adjacent to the power station has been extended along the right shore of the Vakhsh River for length of about 350 meters; it occupies all available space as far as the "salt dome". Here there is an open distribution device at a voltage of 220 kV, an equipment building and a caretaking building.

The scarcity of land, the complicated engineering conditions, and also the technologically assigned direction of the high-voltage power transmission lines predetermined the layout of the structures and the architectural structure of the area adjacent to the power station.

In the design for the architectural formulation of the area adjacent to the power station use was also made of such things as the use of different colors to paint the structures, green plantings, fountains and small architectural forms. The panel "Lenin - Banner" will be used as a decoration on the concrete surface of the existing breast-wall, situated on one of the layers of the excavation forming the area adjacent to the power station.

Inside the machine room of the hydroelectric power station's building, which is 200 meters in length, a light gray marble was used to face the columns. The floor of the machine room is dark (a mosaic with a black granite edge). The assemblies are yellow.

The conditions of the technology determined the type of building for the hydrosystem - its location half below ground. The upper sturdy overhead span of the power station's machine room is arranged at markers of the approach. Along this span move the main operating cranes with a large lifting capacity (from 2 to 360 tons). Equipment is fed within the building to the markers of the floor of the machine room through special apertures in the span. Within the machine room the aperture is solid for the entire length at a width of 12 meters. The roofing over the aperture is in the form of a skylight with both of the lengthwise sides glassed in. The span of the skylight consists of individual (transported by crane) metal elements having a wrinkled, W-shaped structure. The lower surface of the elements, which forms the ceiling, also has a wrinkled surface. The side illumination of the ceiling creates an interesting light effect.

The structure of the skylight extends beyond the machine room from the left and forms a viewing vestibule, which can be entered from the marks of the approach. Thus is created the opportunity to examine the machine room of the power station without the need to go down into the lower marks.

The artificial light of the machine room will be accomplished by using specially developed lamps, placed between the columns along both sides. The far, left shore face is formed by a decorative panel.

At present finishing work on the power station building is underway and work on the service facilities in the vicinity of the hydrosystem is in progress. Work on the dam and on the crest is nearly completed.

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ELECTRIC POWER LINE SEMINAR

Moscow ENERGETIK in Russian No 3, Mar 82 pp 23-24

/Article by G. G. Semenov and V. M. Plekhanov, engineers: "All-Union Scientific-Technical Seminar on 'High-Voltage Equipment of 500 kV and Higher'"/

/Text/ At present the reliability of 500 and 750 kV power transmission is largely determined by the reliability of the operation of the unified power systems of the Soviet Union.

In connection with the construction of powerful atomic electric power stations in the European section of the USSR and the large power complexes (Ekibastuzskiy and Kansk-Achinskiy) the importance of 750 kV and higher power lines for transmitting large amounts of current over great distances is steadily increasing.

Technical-economic justifications and technical designs have been developed; and the construction of ultrahigh-voltage power lines has gotten underway. The first sections of these power lines, as proscribed in the Basic directions for the economic and social development of the USSR, which were ratified by the 26th Party Congress, will be put into operation in the 11th Five-Year Plan.

In accordance with the decision of the Presidium of the Moscow Board of the NTO /Scientific-Technical Society/ on the Power Industry and the Electrotechnical Industry, a seminar was conducted on the topic "high-voltage equipment of 500 kV and higher". The seminar was convened by the section on power systems and networks in cooperation with the production association "Long-distance power transmissions". The purpose of the seminar was to study the results of the operation and adjustment of electrotechnical equipment with a voltage of 500 kV and higher in power systems of the USSR. In addition, the seminar studied the prospects for the development of high voltage equipment, methods of constructing modern substations, and work in the field of direct current fuses.

Participating in the seminar were representatives of the operating, installation, scientific-research and design organizations of the USSR Ministry of Power and Electrification and the ministries of power and electrification of the Ukrainian SSR and the Uzbek SSR, and also the leading associations, manufacturing plants and scientific-research institutes of the USSR Ministry of the Electrical Equipment Industry.

At the seminar reports were given which reflect the technical level of electrical equipment, the status of designing substations, experience in operating equipment, and ways to raise the reliability of the equipment.

The seminar was opened by the Deputy Chief of Glavtekhupravleniye /Main Administration for the Exploitation of Power Systems/, K. M. Antipov, who emphasized the need to fully assimilate and speed up the manufacture of new designs of ultra-high-voltage electrical equipment and to continue research on new models on test stands in Tol'yatti and Belyy Rast.

In their report, N. V. Murashko and M. E. Kheyfits (Energoset'proyekt) /power network designing institute/, which was entitled "Modern requirements for layouts and configuration solutions of substations of 500 kV and higher", noted the trends of the design organizations toward standardization, simplicity, and the clarity of substation layouts and the need to reduce the amount of space required.

L. P. Sidorenko (from the Elektrostroypodstantsiya Trust /Electric power substation construction trust/) in his report, which was entitled "Requirements of the structures of substations based upon industrial methods for their construction using modern construction materials", discussed the possibilities of using flow-line procedures and the unit installation of industrial facilities in construction organizations. He also discussed new ways to do the finishing work on buildings of the substation complex.

G.A. Slavin's and M. N. Khodzhayev's (Energoset'proyekt) report, entitled "Modern requirements of super-high voltage equipment and transformers", was devoted to questions having to do with reducing the space required for modern substations, with using SF_6 gas distributors (KRUE), with the development of equipment for severe weather and climate conditions, and with raising and ensuring a level of reliability of equipment for any conditions. They also proposed fitting circuit breakers with two independent electromagnets for shutting down when there is a significant reduction in the demand for current and a decrease in the sectioning of cables of the circuit control.

In I. Yu. Meleshko's report (from the All-Union Institute of Transformer Building), "Prospects for the development of transformers of a super-high voltage", attention was given to the results of creating and assimilating super-high-voltage and ultra-high-voltage transformers. The maximum capacities of these transformers compare favorably

with the capacities of foreign-manufactured transformers. The 750 kV transformers are being supplied with an acceptable malfunction level (2.2 percent per 100 transformer years in the USSR and 4 percent abroad, according to SIGRE data). The manufactured models of the ultra-high-voltage transformers are now being tested on the powerful test stands in Tol'yatti and Belyy Rast to maximize the use of the experience that has been gained.

V. I. Yazykov's report (from the MPO Elektrozavod), "Prospects for the development of reactors", was devoted to design changes and improvements in 750 kV reactors manufactured prior to 1975. This report described the fact that the first ultra-high-voltage reactor manufactured and installed in Tol'yatti is now in operation and that its design features are now being studied. The assimilation of the manufacture of ultra-high-voltage reactors is determined by the time periods required for modernizing the plant.

G. A. Atamanchuk (Glavtekhupravleniye of the USSR Ministry of Power and Electrification) and V. L. Talover'sya (PEO Donbassenergo) in their report, "Experience in operating the shunting 330 and 750 kV reactors on the Donbass to Western Ukraine power transmission line", presented data on the operation of reactors and also the results of operating an experimental reactor with improved insulation which was manufactured in 1976. In addition, attention was directed at the poor quality of the electropumps (a short service life) and welded seams.

V. I. Pavlov's and V. M. Plëkhanov's (PO Long distance power transmissions) and Yu. S. Frolov's (PO Soyuztekhenergo) report, entitled "Experience in operating and adjusting modern overhead circuit breakers at a voltage of 500 kV and higher", contained an analysis of the operation of switching devices of various kinds. It provided an evaluation of the seviceability of the VV 500 kV circuit breakers with a rise in short circuit currents of up to 30 kA in many power systems. It was noted that the VVB and VNV series of circuit breakers have an increased switching capacity; however, there is no standardization in the pressure of the working medium in the VVB series, while the technological shortcomings of the reinforced valves in the VNV series reduce reliability during their operation. Tests of the VNV circuit breakers at 1,150 kV have confirmed the mechanical characteristics during the testing of the pre-switching resistors at the Belyy Rast substation.

I. M. Bortnik, V. N. Borin, L. P. Kubarev, Yu. T. Savinkov, V. S. Chemeris (VEI /All-Union Order of Lenin and Order of the October Revolution Electrotechnical Institute imeni V. I. Lenin/), and Yu. I. Vishnevskiy (LPO /Leningrad Production Association/ Elektroapparat) presented a report entitled "Experience in developing SF_6 super high voltage equipment", in which it was indicated that the increase in the voltage of electrical devices leads to an increase in the size and bulk of traditionally manufactured equipment. It was shown

that the use of KRUE decreases the amount of land displaced for the project, lowers the cost of construction, simplifies and lowers the cost of operating, reduces the radio interference and solves the problem of protecting personnel from the effects of electric field intensity. It was reported that the developed and tested models of ultra-high voltage equipment using SF_6 insulation have been readied for experimental operation; it is now possible to order the equipment.

S. A. Sovalov and V. V. Kalita (Central Dispatch Administration of the USSR Unified Power System) in their report, "Role and placement of power transmission lines and direct current fuses in the operation of the Unified power system", provided a detailed discussion of ways to increase the controllability and to raise the throughput of intersystem connections. Among the methods noted was the direct current fuse in weak connections, which are shunted by more powerful power transmission lines. To raise the stability of the operation of the unified power system in post-emergency modes during a deviation in sectors of the ultra-high voltage alternating current power transmission lines it is necessary to stipulate an extensive degree of direct current VL regulation all the way to reserving the transfer of capacity.

Ye. I. Lapshin, E. S. Yermolovich, V. A. Vozdvizhenskiy (VEI imeni V. I. Lenin), and A. I. Shchelokov (NPO Elektrokeramika) presented a report entitled "Prospects for the development and creation of direct current switching equipment and overvoltage limiters", in which they examined the parameters and principles of the functioning experimental models (specimens) of 200 and 240 kV circuit breakers. They also presented data on the results of tests on ultra-high-voltage overvoltage limiters and the status of industrial models for experimental testing.

B. R. Nemoshchenkov and I. A. Shishkina (NPO Kondensator) presented a report entitled "Prospects for the development and creation of new types of power condensers and the use of dielectrics in them", in which they noted the features of developing condensers of a greater per-unit capacity in previous sizes, and the use of nontoxic dielectrics.

Having exchanged opinions, the seminar participants noted the importance of adding up the results of the operation of the 500 kV and higher equipment and made the following decisions:

1. To request the USSR Ministry of Chemical and Petroleum Machine Building to provide by 1983 the development and delivery of electric pumps for the transformer and reactor cooling systems, which are to have an increased operating life and a catetory XL along with the fittings.

2. To request the USSR Ministry of Heavy and Transport Machine Building and the USSR Ministry of the Automotive Industry to speed up the creation of transport means with a carrying capacity of up to 1,000 tons.

3. To request the USSR Ministry of the Electrical Equipment Industry to provide for the delivery by the MPO Elektrozavod of cooling systems with precision cleaning assembled filters of the FGN type; and to speed up the VIT /possibly All-Union Scientific Research, Design and Technological Institute of Transformer Building/ realization of a comprehensive plan for the development and improvement of shields for power transformers and reactors.

4. To recommend to the manufacturing plants of the USSR Ministry of the Electrical Equipment Industry (Uralelektrotyazhmash /Urals Electrical Heavy Machine Building Plant/ and Elektroapparat /electrical equipment plant/ that they improve the designs of circuit breaker assemblies, redesign the monitoring and recording instruments, standardize the working pressure, improve the technology for monitoring assembly, raise the plant readiness with a minimum regulation of on-site installation, speed up the development of 750 kV circuit breakers with a reduced number of enlarged modules, use series-connection of control electromagnets in circuit breakers, and examine the problem of reducing the amounts of start-up and adjustment tests at construction projects.

To ask the USSR Ministry of Power and Electrification to order:

Glavtekhupravleniye and PO Soyuztekhenergo to speed up the issuance of a decision regarding the use of methods for monitoring the insulation of super-high-voltage and ultra-high-voltage equipment without shutting down and along with VEI, VIT, and ZTZ /Zaporozh'ye Transformer Plant/ to examine problems having to do with improving the methodology for measuring partial discharges;

PO Soyuzenergoavtomatika to organize the manufacture of stationary transducers for measuring the insulation under voltage and to speed up the manufacture of systems for recording partial discharges;

Glavniiproyekt /Main Administration of Scientific-Research and Design Organizations/ to study the problem of the failure of the built-in voltage regulation system in 750 kV transformers; and to consider it advisable to increase the number of ultra-high-voltage equipment tests on stands and to come up with a unified program for them;

Glavtekhupravleniye to develop measures for modernizing overhead VV 500 kV circuit breakers and to provide them with parts for amplification. Soyuztekhenergo and NITs VVA /Scientific-Research Center for High Voltage Equipment/ to continue their work on bringing the switch-on capacity of VV 500 kV to 35 kA.

Glavenergoremont /Main Administration for the Production of Spare Parts and the Repair of Electrical Equipment/ to expand the production of equipment sets for modernizing the VV 500 kV;

The Main Administration for Material-Technical Supply to provide for the equipping of 500 kV and higher substations now in existence and those now being designed with hydraulic hoists with a crushing crane arm and a lifting height of not less than 18 meters. Glavniiproyekt and Glavenergokomplekt /Main Administration for the Assembly of Power Equipment for Electric Power Stations, Substations, and Networks/ to stipulate in their designs the availability of reserve phases of 750 kV and higher circuit breakers.

Glavtekhupravleniye along with the plants to study the problem of excluding tests and measurements of characteristics, which are not measured in time, from the start-up and adjustment and acceptance and hand-over operations of new electrotechnical equipment.

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ELECTRIC POWER

POWER CONSUMPTION ON FARMS IN BASHKIR ASSR

Saratov STEPNYYE PROSTORY in Russian No 10, Oct 81 pp 45-46

/Article by N. M. Karchugin, chairman of the republic production interfarm association Bashsel'khozenergo; A. A. Tyur, chairman of the department for the electrification of agricultural production of the Bashkir Agriculture Institute; and M. Kh. Gaynullin, scientific worker of the Bashkir Branch of the USSR Academy of Sciences: "The Concerns of Rural Electrification Workers"/

/Text/ At the kolkhozes and sovkhozes of the Bashkir ASSR the percentage of electric motors and electric power units used in the agricultural production process has increased from 2 percent in 1950 to 25 percent in 1980. Moreover, in farms with a high intensification of production the percentage of electricity has increased significantly. For example, at the kolkhoz imeni K. Marks in Dyurtyulinskiy the percentage of electricity now available has reached 54 percent. At the Yumatovskiy sovkhoz this figure is 35 percent and at the Ufinskiy sovkhoz it is 33 percent. At these farms electric power has exceeded the capacity of the tractors. This latter figure is 18, 26 and 22 percent, respectively.

In the future the percentage of electric power in the Bashkir ASSR's agriculture may reach 35 to 40 percent, and its capacity will exceed the capacity of the tractor park, At dairy complexes this capacity is already approaching 80 percent; at hog breeding complexes it is 70 percent. A significant electric power availability in connection with the specialization and concentration of production results in a high level of labor productivity and of electric power available to labor. Thus at the Yumatovskiy complex for the fattening and raising of cattle the electric power available per worker in 1980 was 17-fold greater than on the average for kolkhozes and sovkhozes of the Bashkir ASSR. Here they achieved the least expenditures of labor per centner of weight increase - 2.5 man-hours, a profit of 3.3 million rubles, or more than 47 copecks per kW-hour of electricity.

In the Bashkir ASSR specific work is underway to develope agricultural networks, to increase the reliability of the electric power supply to agricultural consumers, and to further adopt the use of

electric power in kolkhoz and sovkhoz farms. The development of state power systems and connecting agricultural electric networks to them has made it possible to complete an important stage in the electrification of agriculture - to provide electricity to all kolkhozes, sovkhozes, interfarm and other enterprises, organizations and the population.

By the start of 1981, according to data from the Bashsel'khozenergo Association, the Bashkir ASSR's agriculture had 213 transformer substations with a voltage of 35/110 kV, a total rated capacity of 1,277,000 kVA and 14,068 consumer substations with a voltage of 6 - 10/.4 and a total rated capacity of 1,403,700 kVA. More than 32,000 kilometers of high-voltage and 22,7000 kilometers of low-voltage power transmission lines were built and are now operating. Nearly 204,000 electric motors with a total rated capacity of 1,223,400 kV are now in operation. In livestock and other production facilities some 1,255 electric boilers, 2,242 electric heaters, 3,600 electric radiators, 13,260 units for radiating and warming young calves, including 232 automated IKUF-1M unists, are providing a microclimate. The economic savings from one IKUF-1M unit (infrared and ultraviolet radiation) is 18,000 rubles per year. Electricity is used to heat the floors in livestock facilities for 45,200 head of cattle, including hog farms with space for 28,400 head. The economic savings from one such "electric rug" is 47 rubles per year.

By providing for the electrical heating of floors in hog raising facilities and creating a microclimate through the use of electric boilers and electric heaters using total automation there is a sharp increase in the number of suckling pigs that are saved. Thus, at the Igenche kolkhoz in Ilishevskiy Rayon due to the microclimate created in the hog pens the yield of suckling pigs per pen has been 25.1 head as compared with 15.1 for the Bashkir ASSR on the whole.

The consumption of electricity in 1980 was 1,587,000,000 kW-hours, or 64.6 percent more than in 1975, including for production purposes - 935,500,000 kW-hours as compared with 447,000,000 kW-hours in 1975, a more than 2-fold increase. In a per worker estimate for the kolkhozes, sovkhozes, and interfarm enterprises this amounted to 2,109 kW-hours per worker and 195 kW-hours per hectare of arable land. Among the farms leading in the use of electricity there are 12 kolkhozes and 19 sovkhozes. In 1980 each of these farms consumed more than 3,000,000 kW-hours of electricity for production purposes.

During the 10th Five-Year Plan there was a significant increase in the amount of work performed by the republic power production association Bashsel'khozenergo in equipment maintenance and capital repairs to electric power lines and electric equipment in livestock and production facilities of the farms. While in 1976 2.5 million rubles worth of work was completed for technical operation, in 1980 this amount was 7 million rubles, a 2.8-fold increase. Last year 9.9 million rubles were spent on services.

The association is producing cable and lighting fixtures and other output. It has produced a semiconductor voltage limiter, the ON-1, for livestock facilities. The limiter makes it possible to smoothly reduce the operating voltage to 180 and the duty lighting to 110 V. This saves electricity and significantly increases the service life of light bulbs.

Electrode steam boilers, type KEPR with a rated capacity of 250 kV, are being adopted to steam livestock feed. They can produce 320 kg of steam per hour and a boiler temperature of 164 degrees. The amount of time required for steaming is reduced 2- to 2.5-fold as compared with the KV-300 boilers.

Association specialists have prepared a design, the execution of which will make it possible to switch all boilers from liquid and solid fuels to electricity.

The uninterrupted operation of the technological equipment is especially important in livestock farming where the basic operations are confined to a specific time within the 24-hour day. In these conditions the organization of the operation of electric equipment by special services becomes quite important. In those regions where there are interfarm Sel'khozenergo production enterprises, it is wise to transfer to these enterprises the responsibility for maintaining the farms' electrical equipment.

Prior to the start of 1981 724 kolkhozes and sovkhozes out of the 788 were covered by this type of maintenance. Two hundred and fifty farms had arranged for comprehensive technical maintenance (which is the most progressive, rational and promising type of organization for the use of equipment); by 1 June 1981 317 farms had made such arrangements.

The Yuzhuralsel'elektroset'stroy /Southern Urals Trust for the Construction of Rural Electric Power Networks/ Trust built 332 kilometers of low-voltage networks against a plan of 240 in 1980 using kolkhoz funds. This same trust also completed 1,424,000 rubles worth of construction and installation work; their plan had called for 1,000,000 rubles worth of work. Using state capital investments the trust built 62 kilometers of low-voltage networks against a plan calling for 60 kilometers; it also managed to assimilate 281,000 rubles as compared with the 250,000 rubles called for in the plan.

At the same time there are still some serious shortcomings in the area of rural electrification. In the Bashkir ASSR there are few rural 35/110 kV power transmission lines. This significantly slows the growth of labor productivity and the adoption of automation in agricultural production. Thus, in 1980 alone Yuzhuralsel'elektroset'stroy failed to complete six transformer 35/110 kV substations and 57 kilometers of 35/110 kV overhead power lines. Altogether during the past five-year plan the trust shortchanged the Bashkir ASSR's agriculture by 25 35/110 kV substations and 368 kilometers of 35/110 kV power lines.

The electric power supply organizations are not doing enough to regulate the expenditure of electricity at consumer substations. By the start of 1981, 6,330, or 45 percent, of the consumer substations did not have metering equipment.

In several regions of the republic there are still long emergency and unscheduled power shutdowns during which the kolkhozes and sovkhozes do not have electricity. In 1980 there were 2,130 such shutdowns. The total length of the emergency shutdowns was 10,257 hours and the under production of electricity was 3.6 million kW-hours. At the start of 1981 there were 23 livestock complexes without a reserve power supply.

There are also significant shortcomings in the organization of repairs of electric motors and electrical equipment. Thus the Bashkir ASSR State Committee for the Supply of Production Equipment for Agriculture repaired 14,000 electric motors in 1980 against a requirement to repair 34,000 motors.

There are also substantial shortcomings in providing the kolkhozes, sovkhozes, and enterprises of the regional power administration of Bashkirenergo and the production association Bashsel'khozenergo with skilled personnel. This is largely responsible for the relatively slow development of the power industry.

The question of creating an electrification faculty within the Bashkir Agricultural Institute was raised back in the 1960's, but it still has not been resolved. At present there are approximately 150 engineer-electricians working in the agricultural sector of the Bashkir ASSR. At least a thousand of them are needed. There are about 6,000 electricians in the maintenance field. Thus, for each engineer-electrician there is an average of 40 electricians instead of the two or three technicians called for by existing norms and rules.

An important omission is the low loading of the consumer transformer substations. Thus, the time for the using of their installed rated capacity during 1980 was only 1,413 hours, or less than 4 hours per day. Basically, this was caused by the inadequate number of electric motors and electric units providing for the production process.

Another circumstance is of no less importance. The Bashkir ASSR's agriculture, while producing up to 14 percent of the total public product, consumes slightly more than 5 percent of the electricity that is produced in the republic. In view of the difference in the comsumption of electricity and the structure of the power resources by sectors of the national economy, this attests to a disproportion in the electrification of the economy's branches and to a specific violation of the requirements of the law of a planned, balanced development of the national economy.

At the same time the agenda for the day contains an important task to conserve electricity. For example, the fact that many electric motors are installed with a capacity that exceeds what is required for operating machines promotes the irrational expenditure of electricity and its overexpenditure. This leads to a reduction in the RPM's and a drop in the coefficient of capacity (cosine phi), etc.

Estimates, made in view of the growth rates that have been obtained and which were called for by the Party congress, demonstrate that in the next five-year plan the amount of electricity to be provided for the agriculture of the Bashkir ASSR will reach 2.4 billion kW-hours. In the future this will reach four billion kW-hours.

In the comparatively distant future a program-target installation may be the accomplishment of comprehensive electromechanization of all stationary processes. This is connected with the provision of a high relative supply of electricity. For example, at dairy farms of the USA, where the comprehensive electromechanization of all production processes is nearly complete, the annual expenditure of electric power has reached 820 kW-hours per milk cow. Moreover, 62 percent of this power is used for power processes (including 40 percent for the removal of manure), 26 percent for electrical heating, and 12 percent for lighting and radiation.

In the Bashkir ASSR the kolkhoz imeni K. Marks in Dyurtyulinskiy Rayon is approaching this level of power consumption on dairy farms. This attests to the reality of the tasks placed before rural electrification.

Electric power has become an important part of the labor and day-to-day living of the grain growers and livestock farmers and all residents of the rural areas. In this can be seen the implementation of the plans to put agriculture on an industrial basis, as called for by the party and government.

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GENERAL

CURRENT ENERGY PROGRAMS IN UKRAINE REPORTED ON

General Outlook

Kiev PRAVDA UKRAINY in Russian 16 Mar 82 p 2

[Interview with N. F. Nikolayev, deputy chairman of the UkSSR Council of Ministers and supervisor of the Energy Complex Program: "The Energy Complex Program"]

[Text] We tell about a republic specific-purpose scientific and technical program.

The 26th CPSU Congress decided to develop and to realize during the 11th Five-Year Plan an integrated program for scientific and technical progress and specific-purpose programs for the most important scientific and technical problems.

Our republic has affirmed six specific-purpose integrated scientific and technical programs: the Energy Complex, Metals, the Agricultural Complex, Sugar, Labor and Materials Intensiveness.

The editorial board asked Deputy Chairman of the UkSSR Council of Ministers N. F. Nikolayev, who is supervisor of the Energy Complex Program, to answer the following questions.

[Question] What do the basic tasks of the Energy Complex Program consist of?

[Answer] The use of energy, coal, natural gas and petroleum product grows steadily with the rise in social production and in the welfare of the Soviet people. During the current five-year plan the consumption of fuel will increase 7.3 percent, electricity 16.1 percent and heat energy 14.4 percent in the Ukrainian SSR.

The Soviet Ukraine, while being developed within the country's unified economic complex, produces and transmits outside its borders and receives from other republics a large quantity of fuel and power resources. In 1985, we should generate 279 billion kw-hr of electricity and extract and produce 230 million tons of fuel, figured in standard fuel equivalents.

The resolution of these tasks will require not only a buildup in and better use of productive capacity and the reconstruction and modernization of enterprises of the fuel and power-engineering branches but also substantial work to reequip them, to further improve their equipment base and the structure of the fuel balance, and to

make more effective use of energy resources. Naturally, the chief role here is assigned to scientific and technical progress.

The Energy Complex program includes 269 tasks--156 for the creation of new equipment and 113 for the development of progressive technology in power engineering, the coal, oil and gas industries, oil refining and geological exploration. It is characteristic that 86 percent of the indicated tasks are to be completed during the current five-year plan.

Therefore, the whole purport of the work to execute the program comes down to enabling these branches to carry out all the planned measures--from scientific research and engineering development to practical introduction into production--as rapidly as possible and with the best possible quality.

[Question] How is the program being supervised?

[Answer] A coordinating council has been established that exercises organizational and procedural supervision over development of the program, and, along with ministries and departments, takes responsive measures to fulfill the tasks required of it. The council has been vested with supervision over the whole set of scientific-research, experimental-development and technological operations and over the work on serial production of the new equipment that is created in accordance with the program.

The success of this matter will depend decisively upon the work effectiveness of the ministries and agencies that have been called upon to persistently realize the achievements of science and technology, disseminate advanced experience more widely, concentrate efforts and resources on the key tasks of scientific and technical progress, and, what is especially important, insure precise organization for the fulfillment of each task, both by individual stage and as a whole.

[Question] More than a year has passed since implementation of the program started. What has been done, and what remains to be done?

[Answer] There are practical results already. In 1981, 54 tasks to create new models of machinery, equipment, instruments and automation equipment and 27 tasks to create progressive technology were completed. The fabrication and proving out of various types of new equipment has started, and recommendations have been developed for introducing more modern methods of organizing production.

This has helped the republic to generate 140 million kw-hr of electricity above the plan, to recover much crude and gas, to win 134,000 tons of fuel peat and briquettes, and to produce a substantial quantity of petroleum product. The increase in generation of electricity at nuclear power stations released 4.9 million tons of fossil fuel. Savings of electricity and heat energy and of gasoline, boiler-and-furnace fuel and diesel fuel were achieved.

At the same time, the coal industry did not cope with the plan for coal mining. Some ministries and departments did not fulfill tasks for saving fuel and power resources, and UkSSR Minchermet [Ministry of Ferrous Metallurgy] and UkSSR Minugleprom [Ministry of Coal Industry] even permitted substantial overconsumption. Thermal electric-power stations of UkSSR Minenergo [Ministry of Power and Electrification] did not incorporate fuel-consumption in its norms. Certain Energy Complex

Program tasks were not completely fulfilled, and part of the work was postponed to a later date.

The coordinating council is taking steps to provide scientific-research and design-development operations with the necessary supplies, equipment, and labor and financial resources, and it has strengthened its monitoring of progress in program fulfillment.

UkSSR Minenergo, for example, has been given the task of providing for a more complete load on large, highly economical power units at thermal power stations, accelerating the modernization of power-engineering equipment for the effective use of low-grade coal, and achieving a constant reduction in specific fuel consumption for the generation of electricity. Much scientific research is being carried out and many progressive developments are to be put into practice in all the fuel branches.

The Energy Complex Program is an important component of the state plan and should be an effective lever in solving 11th Five-Year Plan tasks. Its execution will, in the final analysis, provide the national economy and the population with an uninterrupted supply of fuel and power and will help to achieve the final technical, economic and social targets called for by 26th CPSU Congress decisions.

* * *

Reports by supervisors of the republic's ministries and departments about progress in fulfilling Energy Complex Program tasks are published below.

Coal Industry

Kiev PRAVDA UKRAINY in Russian 16 Mar 82 p 2

[Article by N. K. Grin'ko, UkSSR minister of Coal Industry: "Coal"; passages enclosed in slantlines printed in boldface]

[Text] The coal industry is rightfully considered a key branch of the fuel-and-power complex. /Our republic produces one-third of the country's mined coal and about half of the coking coal, which is valuable./

In the past 20 years considerable shifts have occurred in the branch's development. Narrow-front machines and longwall-mining machines have come to replace the cutters and wide-front equipment, enabling the workload per breakage face to be more than doubled. More than 1 billion tons of fuel were mined in the republic during the 10th Five-Year Plan.

Right now half of our mines are in the "deep" category, and 73 of them are working at depths of more than 800 meters. Mine-geology conditions worsen considerably with increase in depth.

The branch has approached solution of these problems, which require an accelerated pace of capital construction and reconstruction of the underground-mine inventory and augmentation of the program for reequipping on a progressive foundation. These and other questions have been reflected in CPSU Central Committee and USSR Council of Ministers decrees about accelerating the reequipping of underground mines with machinery, raising the miners' wage fund and developing strip mining.

The new documents are of great economic and social significance and testify convincingly that the aims of the 26th Party Congress assuredly will be implemented. The negative tendencies of the branch's work contrast with the active measures, whose execution has already started and will be implemented during the current and the 12th Five-Year Plans in accordance with the integrated specific-purpose Energy Complex Scientific and Technical Program. More than 50 organizations--NII's [scientific research institutes], vuzes and associations--have been assigned to work in this program. The program was aimed at the most severe and most important problems.

New technical resources are to be created, assimilated and introduced--KM-103 and KD-80 longwall miners for excavating slightly sloping seams of 0.75 to 1.2 meter thickness. The KM-103 longwall miner, as industrial tests have indicated, enables effective work at seams of minimum thickness (0.75 meter). SO-75 and US T-2M scraper-cutters will improve the grading of the coal fuel being mined, and the KRT tunneling combine will enable a penetration pace of 7-8 meters per day in hard rock. Supports, shields and longwall miners of various types will enable the workload on longwalls on a sharp dip to be almost doubled. Drilling machines will be capable of directional drilling of large-diameter holes a story in height and of raising labor productivity 4-fold to 6-fold. New hydraulic props of increased load-carrying capacity and metal roof timbers for individual reinforcement of breakage faces are appearing.

Work on solution of the problems of controlling the heat regime of underground mines, preventing sudden outbursts of coal, rock and gas and methane and coal-dust explosions, developing nontraditional (shaftfree) methods for excavating coal, and other problems is planned.

In order to provide for successful realization of the program, a coal-industry section has been formed within the coordinating council, which is vested with the functions of developing, realizing and executing the monitoring and coordination of work under the program. The section's meetings have examined the status of fulfillment of the program and have also adopted a decision to refine the program's tasks in accordance with the decisions of the November 1981 CPSU Central Committee Plenum and of the Ukrainian Communist Party Central Committee.

/Last year a definite scientific backlog of accomplished work was built up for a number of the problems enumerated. Underground-mine tests have been completed and a decision adopted to produce the KM-103 longwall miner serially. The KGU-D mechanized support and the Poisk-2 cutter-loader have passed tests on steep seams. A test model of the KG longwall miner for excavating coal from longwalls on the seam's strike has been fabricated./ An industrial test check has been made of the method of forecasting the outburst hazard of coal seams in accordance with the tectonic conditions of deposition....

However, some of the work carried out is not yielding positive results. Thus new solutions have not been found for the integrated mechanization of extremely thin seams (Giprouglemash [State Design-Development and Experimental Institute for Coal Machinebuilding] and the Druzhkovka Machinery Plant), and work to create means for preventing methane and coal-dust explosions (the Makeyevka NII and Kiev State University) is being conducted poorly. Exploratory work on the creation of unmanned coal-mining equipment (Institute of Geological-Engineering Mechanics of the UkSSR Academy of Science) should be speeded up.

Of course, one does not deal with a big matter without encountering difficulties. A closer creative collaboration of scientists and production workers and persistence in solving the tasks and problems stipulated by the Energy Complex Program are required here. Everyone who participates in realization of the tasks should accurately visualize the main goal--to provide an uninterrupted supply of fuel to the national economy.

It goes without saying that solution of the tasks set for the coal industry will depend upon precise coordinated work by the ministry, the associations, the underground mines, plants and scientific organizations.

Comrade V. V. Shcherbitskiy's report to the November 1981 Plenum of the Ukrainian Communist Party's Central Committee noted that the problem of developing the fuel-and-power complex affects the whole national economy. This obligates us to take the most decisive measures with a view to eliminating the branch's lag more quickly. Growth in the capacity of the underground mines is not expected this year. Therefore, in order to carry out the strenuous plan, to prevent a lowering of indicators, and to stabilize the branch's work, we must sharply increase the average daily mining of coal.

An acceleration of technical progress, the elimination of bottlenecks, a rise in labor productivity, and an intensification of organizational work at all levels of management of the branch will enable the traditional causes for reduction in the coal industry's production effectiveness to be overcome.

Power Engineering

Kiev PRAVDA UKRAINY in Russian 16 Mar 82 p 2

[Article by A. N. Makukhin, UkSSR minister of power and electrification: "Power Engineering"; passages enclosed in slantlines printed in boldface]

[Text] Electric-power engineering of the Soviet Ukraine, which is providing a stable power supply for the economy, has been raised to a qualitatively new level in recent years.

The total capacity of the republic's power stations now is 45.3 million kw, including about 4 million kw from nuclear stations. The total length of the power transmission lines has passed 800,000 km. In 1985 the generation of electricity in the republic is to be brought up to 278 billion kw-hr. The quantitative and qualitative indicators of the branch's work are to be raised.

Realization of the Energy Complex Program, which incorporates solutions of the main tasks for developing power engineering, raising the reliability and economy of operation of the equipment, and improving the quality of the supply of electricity and heat, will help to achieve this aim.

/The shortage of fossil fuels will be compensated for as nuclear power stations are built and put into operation. The Zaporozhskaya, Khmel'nitskaya and Yuzhno-Ukrainskaya AES's have been added to the two operating Chernobyl'skaya and Rovenskaya AES's./

/In 1985 every fourth kilowatt-hour of electricity will be generated at nuclear power stations, enabling about 100 million tons of coal to be released for the needs of the national economy during the 11th Five-Year Plan./ For purposes of assimilating AES power units into operation and of bringing the indicators of their operation up to design capacity most speedily, joint work by power engineers and scientists of UkSSR Academy of Sciences institutes and of other scientific institutions is called for.

A cardinal task of the Energy Complex Program is also that of raising operating indicators, primarily the operating reliability of equipment at thermal electric-power plants, it being necessary to solve this problem while the quality of the solid-fuel being delivered is worsening.

In order to raise the economy and reliability of operation of equipment of thermal electric-power stations and to improve the use of low-grade steam coal, the program calls for the modernization of 47 power units with a total capacity of 14.2 million kw, and the rebuilding of the equipment of three thermal power stations.

/Scientific research about raising the combustion efficiency of low-grade fuel is going on in collaboration with scientists of the UkSSR Academy of Sciences, the republic's Minvuz [Ministry of Higher Educational Institutions] institutes, and coal-industry institutions./

But it is practically impossible to do a good job of adapting the existing equipment to the combustion of low-grade coal. Therefore, solution of this problem--of upgrading coal--is being given to Minugleprom [Ministry of Coal Industry]. Here we appeal directly to the coal miners and to those who are participating in the program's work.

The Energy Complex Program pays great attention to further development of centralized heat supply. Along with the introduction and mastery of new capacity at Kiev TETs-6 and Khar'kovskaya TETs-5, reconstruction of the equipment of the Pridneprovskaya GRES and other power stations is called for. This will allow a large number of low-capacity and uneconomical boilerhouses to be closed.

The program contemplates the conduct of a set of measures for raising the reliability and economy of operation of the power grids. The stability of the electric-power supply to customers, primarily agricultural customers, should be raised, and power losses in the grids should be reduced.

The most important components of the Energy Complex Program are tasks to further reduce the use of manual labor, mechanize and automate production and raise the technical level of repair work. It is planned to create within power associations new repair bases and repair-and-maintenance centers, and shops and sections that have been mechanized in integrated fashion. This will enable the level of mechanization and automation of the branch's work to be raised, the conditional release of 7,650 workers, and the transfer of 7,840 workers from manual to mechanized labor.

/The creation, jointly with scientists, of equipment and technology for the use of solar energy and of energy from the wind and from the earth's deep heat is also called for./ Thus, in the Crimea the construction of an industrial-test solar electric-power station of 5,000-kw capacity (SES-5) has started. Optimal solutions for the design development of SES's [solar power stations] will be worked out and experience in their operation will be gained.

The Ukraine's power workers provided in 1981 for the fulfillment of Energy Complex tasks on the introduction and assimilation of capacity at nuclear electric-power stations, the modernization of equipment at thermal electric-power stations, and the introduction of a number of measures for raising the reliability and economy of operation and the mechanization and automation of production.

/The economic effect obtained as a result of accomplishment of the power-engineering portion of the program will be an estimated 500 million rubles per year./

Oil Industry

Kiev PRAVDA UKRAINY in Russian 16 Mar 82 p 2

[Article by S. N. Gorev, general director of Ukrneft' [Ukrainian Oil-Production Association]: "Oil"; passages enclosed in slantlines printed in boldface]

[Text] Our association is taking steps to further raise production effectiveness, to improve utilization of the oil and gas well inventory, to reduce the time taken to introduce new fields into development, and to concentrate exploratory drilling in the most promising parts of the Dneprovsko-Donetskaya depression and the Ciscarpathian trough.

Thanks to improvement of the equipment and technology for recovering and treating oil and gas, it is planned to greatly reduce processing losses thereof during recovery, transport and storage.

The thoroughness of withdrawal of crude from the ground is to be increased. The main method for raising withdrawal in our country and abroad is waterflooding. At the Ukraine's fields, taking the peculiarity of the geological structure and development into account, practically all waterflood methods have been mastered--those known to us and abroad. However, a large amount of crude is still being left in the ground. New methods are needed.

/The Energy Complex Program calls for the performance of industrial-test operations for the more complete extraction of crude from the ground. UkSSR Academy of Sciences institutes, branch scientific-research institutes, vuzes and the Borislavneftegaz, Dolinaneftegaz, Nadvornayaneftegaz and Chernigovneftegaz oil and gas production administrations have joined in./

Right now steam-heat stimulation is being conducted at oil-bearing formations at two sections of the Borislavskoye field, and also at the Urychskoye deposit of the Skhoditskoye field. Surfactant-water solutions are being injected into the oil-bearing formations of the Strutynskoye and Staro-Samborskoye fields. At the Glubinnaya deposit of the Bitkovskoye field, the oil-bearing formations are being stimulated by high-pressure gas and by a water-gas mix.

At the Dnedintsevskoye field in Chernigovskaya Oblast, at a completely worked-out section, wet in-situ combustion has started, and the buildup of facilities for an experimental section for introducing a completely new process of dissolving oil in water within the formation at high temperatures and pressures is being completed.

/These operations have become a component part of the Energy Complex Program. Accomplishing them will enable substantial additional reserves of crude that still

remain in the formation to be involved in development./ Much crude will be recovered during the current five-year plan as a result of introducing these measures.

Gas Industry

Kiev PRAVDA UKRAINY in Russian 16 Mar 82 p 2

[Article by A. G. Tumanov, chief of the All-Union Ukrgazprom Industrial Association: "Gas"; passages enclosed in slantlines printed in boldface]

[Text] /In order to satisfy more completely the requirements of the national economy and the people and to enable gas to be exported, new high-capacity Urengoy-Uzhgorod, Yelets-Kursk-Kiev, Ostrogozhsk-Shebelinka, Ivatsevichi-Dolina and other trunk gas pipelines are to be built during the current five-year plan./ The active capacity of underground storage will grow 2½-fold, based upon the use of depleted fields.

Not only is the unit capacity of the equipment to be increased 2-fold to 3-fold but construction time for gas-field and gas-transport facilities is to be reduced.

One of the Energy Complex Program's tasks is to raise the effectiveness and reliability of gas supply for customers and to reduce losses of gas and condensate to a minimum.

The shutdown of a gas pipeline for just 1 day in order to perform preventive maintenance by the traditional method requires cessation of the delivery of more than 100,000 tons of standard fuel equivalent to customers. That is they the development and introduction of new technical solutions that will permit work to be conducted without shutting down the gas pipeline, without permitting losses, is so important.

In order to increase the effectiveness of gas-condensate field development, more complete extraction of the gas, and especially of liquid hydrocarbons, from the ground is necessary. Ukrgazprom has built an industrial-test "cycling process" station at the Novotroitskoye field in Poltavskaya Oblast and is making industrial tests.

/This method is also to be introduced at the Kotelevskoye and Timofeyevskoye fields, allowing the extraction of condensate to be increased 15-20 percent, with an expected total benefit of about 100 million rubles./

Just what is the "cycling process"?

This is a method for developing fields that maintain reservoir pressure by injecting gas into the productive formation. It provides for more complete extraction of the initial gas-condensate reserves. We are doing the work for the first time in the country at two gas-condensate fields--Novotroitskoye and Kotelevskoye.

We are experiencing a severe need for pipe, high-pressure compressors, cooling installations and other equipment. We are counting on the active assistance of the metallurgists and machinebuilders.

In order to reduce gas and condensate losses, a single closed system for gathering gas condensate from the Dneprovsko-Donetskaya depression fields is being created, with the gas to be stabilized at an installation for gathering, stabilizing and filling at the Seleshchino Railroad Yard of Poltavskaya Oblast.

/The Energy Complex Program also includes the introduction into operation in 1983 of seven filling stations for fueling motor vehicles with compressed natural gas in Donetskaya, Khar'kovskaya and L'vovskaya oblasts,/ which will provide for a substantial saving of liquid motor fuel.

Geological Operations

Kiev PRAVDA UKRAINY in Russian 16 Mar 82 p 2

[Article by P. F. Shpak, UkSSR Ministry of Geology: "Geology"; passages enclosed in slantlines printed in boldface]

[Text] The Ukraine's earth contains all types of mineral fuel-and-power resources: oil, gas, gas condensate, black coal, brown coal, fuel shale and peat.

/In the past 10 years the geologists have discovered more than 60 oil and gas fields and also proved out the prospects for oil and gas bearing horizons that were deposited at depths of more than 4,500-5,000 meters, primarily in the eastern Ukraine./

Large deposits of coal were discovered in new regions--the Lozovaya Coal Basin of Khar'kovskaya Oblast, the Starobel'sk Coal Basin of Voroshilovgradskaya Oblast, and the southwestern L'vov-Volyn Coal Basins. Coking-coal reserves in the Donbass [Donets Coal Basin] have been expanded. In Dnepropetrovskaya and Khar'kovskaya Oblasts, large fields of bituminous brown coal have been explored for open-cut mining. The integrated processing of this coal will enable valuable mineral raw materials--mineral wax and high-quality fuel briquettes--to be obtained.

At the same time, there are some serious complexities in building up fuel-and-power resources reserves. The chief one is that prospecting for these types of raw materials must be done at great depths, where mining geology conditions are complicated.

Despite the increased effectiveness of geophysical methods of exploration, only a hole can give a final answer about the presence of fuel-and-power resources in the ground and the extent of them. And drilling has to be done for more than 70 percent of the geological work.

/Therefore, the main thrust of the Energy Complex Program has been on problems of increasing speed of drilling holes during exploration for oil, gas and coal fields./

Scientists of the Institute of Superhard Materials of the UkSSR Academy of Sciences have developed a new material--tseval, which consists of a hard alloy and synthetic diamonds, and they are creating, on the basis of it, new types of drill bits, from which we expect a 1.3-fold to 1.5-fold increase in mechanical drilling speeds and the same or an even better increase in stability.

Scientists of the ministry's branch institutes--UkrNIGRI [Ukrainian Scientific-Research Institute for Geological Prospecting], IMR [Institute for Mineral Resources] and the Dnepropetrovsk Mining Institute--are developing progressive technology for drilling and for casing wells under complicated geological conditions at great depths.

/The program is intended to increase 2-fold to 3-fold the amount of hole-drilling for oil and gas with new types of bits at augmented regimes (with increased loading and flushing) and to equip drill rigs with new monitoring and measuring instruments./

These and other technical and technological innovations promise to increase hole-penetration speed by 20-30 percent, to greatly accelerate the exploration of the fields, and to provide for successful fulfillment of five-year plan tasks.

Such large production associations of the ministry as Donbassgeologiya, Poltavneftegazgeologiya, Krymgeologiya, Chernigovneftegazgeologiya, Zapukrgeologiya, and Voroshilovgradgeologiya are taking part in a major set of operations for the Energy Complex Program.

In addition to the Energy Complex Program, problems that face the republic's geologists are being solved within the framework of the Geological Exploration Operations Program, which was approved by UkSSR Gosplan, in accordance with seven integrated plans for joint research by UkSSR Academy of Sciences institutions and UkSSR Mingeo [Ministry of Geology] for 1981-1985, and also in accordance with nine specific-purpose branch programs that have been approved by the ministry.

Oil Refining

Kiev PRAVDA UKRAINY in Russian 16 Mar 82 p 2

[Article by G. Ye. Lesnichiy, chief of UkSSR Glavneftekhimprom [Main Administration of Petrochemical Industry]: "Oil Refining"; passages enclosed in slantlines printed in boldface]

[Text] /Our republic's oil-refining industry has been created practically within the past 10-15 years. In the last five-year plan alone more than 30 production facilities were built./

The Energy Complex Program called for a substantial rise in the utilization effectiveness of crude oil. Special attention will be paid to the development of secondary processes, a reduction in losses of crude and of petroleum product, and the rational use of gases that are being generated.

The growth of technical progress in motor-vehicle manufacturing requires improvement of the quality and change in the structure of the motor fuels being produced. For this purpose, a further buildup in capacity for catalytic reforming and cracking of the raw material, the introduction of new and more effective catalysts, and the conversion of installations to severe operating regimes are planned for the current five-year plan. Thanks to this, the share of high-octane gasolines will be increased to 85 percent of the total gasoline output by the end of the five-year plan.

A reduction in the sulfur content of fuel is yielding great national economic benefit, because of which additional capacity for hydrorefining will be introduced. /As a result, almost all diesel fuel produced in 1985 will be low in sulfur./

A set of measures for saving raw material and for the repeat use of petroleum product also is to be executed. Existing installations for the reclamation of spent oil should go into operation, the introduction of equipment for air cooling will be continued, the equipping of tanks with pontoons will be completed, and gas facilities will be rebuilt. /All this will permit us to save more than 250,000 tons of petroleum product./

A substantial portion of the low-calorie gases that are formed during the production of commercial-grade carbon is not now being used because of a shortage of recovery installations. /The Energy Complex Program calls for the construction of four additional recovery boilers in order to save almost 80,000 tons of standard fuel equivalent. Through this and the introduction of a number of other measures, and through improvement in the use of secondary energy resources, 600,000 tons of standard fuel equivalent will be saved, in all.

Petroleum Product

Kiev PRAVDA UKRAINY in Russian 16 Mar 82 p 2

[Article by N. S. Kotenko, chairman of the UkSSR State Committee for the Supply of Petroleum Product: "Petroleum Product"; passages enclosed in slantlines printed in boldface]

[Text] The UkSSR State Committee for Supplying Petroleum Product, which was established in 1980, transports, stores and distributes petroleum and petroleum product to the republic's economy, and it also dispatches them to other Union republics and for export.

Losses occur along the entire path of petroleum product, from the refineries to the customer, as a result of evaporation, leaks, spills and change of quality.

/How to reduce losses? This is one of the main tasks in our part of the Energy Complex Program./ Much is being done. For example, in order to lessen the escape of gasoline into the atmosphere, tanks are being equipped with floating pontoons made of polymer materials. To avoid overflows, tanks are being equipped with special sensors that will restrict pouring. The bulk plants at maritime and river docks are being equipped with new hose installations. Immersion oil pumps manufactured by the Kiev Test and Experimental Plant are being introduced. At motor-vehicle refueling stations a special nozzle is used that automatically shuts off when the maximum fuel level in the vehicle's tank is reached.

/These are savings, and they are great. But not everywhere is petroleum product being used rationally and thriftily./ Checks conducted by Gosnefteinspektsiya tell about this. In some cases petroleum product is being expended for an unintended purpose, lost because of poor storage or accounting, or written off in automotive transport work.

/One of the most important measures for saving fuel and power resources and making repeat use of petroleum product is the collection and reclamation of spent oil./

Almost a fourth of the enterprises and farms do not meet the goals for collecting this oil. Collecting it still has not been organized in cooperative garages.

What is more, spent oil that has been collected is being used irrationally: it goes, mainly, into fireboxes. The erection of reclamation installations at the Kremenchug Oil Refinery and at other enterprises where its introduction has been planned under the current five-year plan must be speeded up.

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SEVERAL FACTORS HOLD BACK DEVELOPMENT OF YAMBURG GAS FIELDS

Moscow SOVETSKAYA ROSSIYA in Russian 13 Mar 82 p 2

[Article by I. Ognev: "The Road to Yamburg"]

[Text] Siberia: The strategy of development.

"I greet everyone on the holiday," said Nadymgazprom [Nadym Gas Production Association] party secretary A. Khoruzhenko to those who had gathered in the recreation and reading room. "In accordance with the old custom, allow me to hand out the round loaf. Try it out on the spot...."

On the spot--this is at the Yamburg gas-condensate field, to which on that day, 18 January a track-trailer combination had been sent. It had taken only what was most necessary for consolidating the hold on the new location. The rest will be delivered here by helicopter.

Yamburg....While at Medvezh'ye's ninth installation, from which the assault on Yamburg had been launched, one can still walk about a small stand of trees, even if they are sparse and short, there are neither bushes nor saplings 200 km to the north, at the expedition's target. During the winter the raspberry sun is barely seen on the hillocky flatland, while the wind carouses with a whistle. Sixty degrees below zero is not rare, and permafrost is everywhere. But here, in the center of the empty Tazov Peninsula, the geologists have discovered a gas condensate field that is second in the world in magnitude of reserves. Now, it seems, its time has come.

"It seems" was not used accidentally: for several years scientists and practical workers have been discussing when and how gas-field workers should get to Yamburg. It appears that the old sudden reversals that occurred concerning the oil and gas-bearing Ob' region just after a blowout from now-legendary well R-2 near Berezovo village had decided the future of geological exploration and exploitation of these most rich fields was being repeated in this polemic in the positions of those who want to rush to the storehouse and those who are inclined to wait for the best time.

About 4 years ago the person who was then chief of All-Union Tyumengazprom [Tyumen' Gas Production Association] spoke these lines to the author: "We are being pushed toward Yamburg, but meanwhile industry has not managed to develop the output of northern variants of the equipment. It is not known how the permafrost should be tackled. For it is quite different there from Urengoy's...." Later came references

to the gigantic reserves of Urengoy, capable of supporting a high pace of growth of gas and of the requirement for export. As for equipment adapted to work under local conditions, the problem is still severe. And to just what extent are the other arguments well founded?

Here is the opinion of V. Smirnov, doctor of economic sciences and manager of the Laboratory of General Power Engineering of the USSR Academy of Science's Institute of High Temperatures. There are several factors that cause misgivings about the validity of the wait-and-see policy, he considers. It is impossible to approach Tyumen' with ordinary criteria. It has the planet's largest gas fields, but also extremely difficult natural and climatic conditions, and it is very difficult to create the production and social infrastructures. These factors are telling to a pronounced extent in the difficult environment of Urengoy. But even if these singularities did not exist, one must not concentrate the recovery of a large part of the country's gas at two or three fields. In this case, the uncertainty factor rises sharply and this is intolerable in the fuel-and-power sphere.

The scientists' calculations indicate that anticipatory capital investment for expanding the scale of recovery will give freedom of maneuver--both operationally and economically. As a result, profit will greatly exceed initial expenditures. On the contrary, a narrowing of the raw-materials base threatens difficulties of various types. By the way, this truth is well known. But up until now not all managerial elements have accepted the thought that, even under the most rigid savings regime, the zealous proprietor is not the one who withholds funds with all his might or divides them up on the "inheritance" principle.

As for the problems of scientific and technical preparation for going to Yamburg, then there is actually a multitude of unsolved problems. How to build roads if the soil's ice content is 70 percent? How will the integrated gas-treatment installations behave there? How will transportation of the "blue fuel" go under permafrost conditions? Such questions can go on and on. But in order to bite through the Yamburg nut, one must as a minimum put it in his mouth.

"Sitting in Nadym and Urengoy, one can only theorize," said O. Andreyev, deputy director of VNIIGAZ [All-Union Scientific-Research Institute for Natural Gas], which is developing the operational portion of the field's design. "Three holes, which we hope to drill through this year, will serve science better than 100 assumptions."

It would appear that the arguments against the assault on Yamburg are groundless. In 1986 two of its installations should yield 36 billion cubic meters of gas. Recalling the impressive scale of capital investment in developing the field--almost 3½ billion rubles--scientists, production engineers and Tyumen' construction workers insisted on a start of this great work in the first year of the five-year plan. Unfortunately, Mingazprom [Ministry of Gas Industry] came out with an excess, in our opinion, of cautiousness. Previously, the opinion of Tyumen'gazprom supervisors had fallen on fertile soil, but a start on building up the facilities of the Yamburg field disappeared from the ministry's plans for 1981.

This Mingazprom policy chained the builders. They had all the foundations for getting anticipatory financing. Indeed, Urengoy indicated that in the construction field, slowness breeds many losses. The builders came here a year and a half after the gas-field workers, and a picture that is familiar, alas, emerged before their very eyes: makeshift thing on makeshift thing, which appear cheap today even to

an amateur. Don't continue this unsuitable tradition at Yamburg! But not long ago, while in Nadym, First Deputy Minister of Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises] Yu. Batalin announced that the ministry is not ready to begin operations at the new field this year.

"Unfortunately," says V. Kuramin, Chairman of USSR Gosplan's Interagency Regional Commission on Problems of the West Siberian Oil and Gas Complex, "no regulation exists that requires that a preparatory period precede the buildup of a field's facilities. This shortcoming does not allow documentation to be worked out thoroughly and the construction subunit to be formed and to get on its feet."

Where it does get firmly on its feet, it has to do so at a full gallop. For 1982, tens of millions of rubles have been released under the new capital-investment plans. Half is for the builders. Nadymgazprom is to master the rest with its own forces. But Minneftegazstroy has not determined firmly which subunit will work at Yamburg. In passing, the forces employed at Nadym or Urengoy, which have their hands full with their own concerns, cannot control Yamburg. With this capital investment a trust must be created. However, time has already been slipping by....

There is no place for the gas recovery workers to fall back on. And they were sent to Yamburg, which, as they say, is not easy. Be that as it may, the column went. Others will go later. Now is the right time to ponder what the various agencies must do in the Tazov tundra to master Yamburg's gas deposit effectively.

The gas-field workers have advanced the motto: honor the best experience of Medvezh'ye and avoid its mistakes. YuzhNIIGIPROGAZ [State Scientific-Research and Design Institute for the Design of Gas-Industry Enterprises in the Soutern Economic Region] designers tried to carry out the first part of the motto. It is more complicated with the second part, although one step has been taken: at Yamburg, since the very start, there has been a single client--Nadymgazprom [Nadym Gas Production Association]. Its collective acquired solid experience in this role during the buildup at Nadym. The association went first to Urengoy and is full of decisiveness to cut short any lapsing into bureaucratism.

And there is more. The design calls for transforming the bed of the local stream, which is hardly knee-deep in summer, into a deep 300-meter canal, thereby enabling ships to be unloaded conveniently. But the Irtysh River Shipping Line rejected the design right off: there is no equipment, they said, to implement it. The rivermen's position threatens to repeat what occurred during mastery of the Medvezh'ye: the port in Nadym was adopted when the field was already yielding output.

Yamburg should produce gas in the first year of the 12th Five-Year Plan. This means that at the start of 1985 it will be necessary to undertake the erection of two installations for integrated treatment of the gas. And, at the end of the year, a third one. Also in 1985, Yamburg should have provided itself with an adequate inventory of wells and the facilities for them should have been built up. The drillers, in the opinion of Tyumen'gazprom Chief Engineer Yu. Topchev, must be deployed not later than 1984. And the base and the housing should be ready, to put it mildly, by this date, or even earlier. The forthcoming flow of freight must be coped with for three navigation seasons, and, if the current one is not used, then the planners may, with a great deal of probability, have to set back start of the field's operation..

To what extent are the other participants in the Yamburg operations ready for the startup work? The power workers must undertake an LEP [power-transmission line] to Yamburg in time. Nevertheless, as Nadymgazprom General Director V. Strizhov has reported, until now there is no firm plan for capital investment for 1983 and beyond. Both USSR Gosplan and Mingazprom promise to allocate funds, but above the ceilings. And this proviso engenders the well-known uncertainty also about preparation of capacity on the part of the builders and about providing capital investment for materials and resources.

As for roads, at Urengoy, for example, the timely startup of one installation was disrupted just because there was no highway to it. And this case is not unique. If the builders will move on a concrete strip, Yamburg gas will become much cheaper. But the 3 million rubles of capital investment that is planned for this purpose for the year is not enough.

Finally, several problems remain whose solution for a time was marked only by a broken line. The first problem is that no underground water was found at the field.

"In any case," says YuzhNIIGIPROGAZ Director N. Portyanko, "alternative variants have been readied: either the construction of water-collecting structures in the Ob' Gulf, which is complicated by shallow water and strongly moving ice in the spring, or a deepening of lakes."

Searches for water continue with the help of scientists of the Siberian Department of the USSR Academy of Sciences, who are developing new and effective methods.

The second problem, in the opinion of secretary of the Nadymgazprom party committee A. Khoruzhenko, is more complicated. Up until now there has been no firm assurance that the uninhabited Tazov Peninsula is suitable for settlement with people. And meanwhile Gosgrazhdanstroy [State Committee for Nonindustrial Buildings and Architecture] already has this task: in 1982 it is to compile and approve a design for the city of Yamburg, for 30,000 residents. As yet this mechanism has not begun to turn, and the scientists who are working on problems of man's adaptation to the North can and should have their say.

The third problem embraces everything that was said previously. Many specialists with whom I managed to converse were convinced that a program should be worked out in detail so that the agencies that are participating in building up facilities at Yamburg, and science, which is called upon to lay a qualitative basis for their actions, may be managed with assurance. Great hopes are vested here in USSR Gosplan's Interagency Regional Commission on Problems of the West Siberian Oil and Gas Complex. Practical steps of this new organ will compel faith in the effectiveness of the beginning.

...On the evening of 23 January the column reached Yamburg through snowstorms and cold. They were met by V. Pridatko, N. Okhrimenko and A. Litvinov--Nadymgazprom workers who had made the mobile housing habitable 13 days earlier and had been receiving helicopters with cargo. And now they had met the comrades with several buckets of hot tea. They ceremonially took out the round loaf and shared almost 70 parts. Yes, the first regiment of Yamburgers had arrived, and the assault on the gas-bearing North is being expanded in breadth and depth. But although some joker had written "the tundra is not outer space" on one of the tractors, mastery of the Yamburg will require much effort, and the main thing, coordinated effort. There is still time, and this can be done with minimum outlays.

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GENERAL

KAZAKH POWER WORKERS EXHORTED TO CURE THEIR BRANCH'S ILLS

Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 3 Feb 82 p 1

[Editorial: "Power Engineering Reserves"]

[Text] The 26th CPSU Congress contemplated a vast program for social and economic transformations for the 11th Five-Year Plan. A more detailed elaboration of the basic areas for carrying out this program was defined at the November 1981 Party Plenum. The plenum's resolution and the brilliant speech there by CPSU Central Committee General Secretary Comrade L. I. Brezhnev noted that the policy adopted for the outstripping development of key branches of the national economy should be based primarily upon an accelerated growth in the generation of electricity.

The efforts of the party and the people in Kazakhstan have created a huge power-engineering potential that has a total capacity of more than 13 million kw. A sharp qualitative shift has occurred in power generation itself. It has been given new equipment and it continues to be reequipped on a modern technical basis. All this enables the constantly rising requirements of all spheres of the national economy to be completely supplied with electricity and the people's everyday living conditions to be improved from day to day. Much experience in the highly effective operation of advanced power-engineering enterprises has been accumulated in the republic.

Meanwhile, these achievements cannot conceal those shortcomings that still exist in development of the power-engineering complex as a whole, and those enormous and, unfortunately, unused reserves that are incorporated in them. The extent to which the republic's economy is supplied with electricity continues to lag behind the rapidly rising requirements.

Last year power-engineering workers did not cope with the most important indicators, and, the main thing, they did not insure fulfillment of the task on the generation of electricity. The capacity utilization factor at thermal power stations was low, especially at Ekibastuzskaya GRES-1 and at practically all North Kazakhstan power stations. All this led to the imposition in November and December of last year and during the elapsed period of this year, during the morning and evening peak-power loads, of substantial restrictions on the customers. Because of this, ferrous and nonferrous metallurgy enterprises, machinebuilding and other industries, and sovkhozes and kolkhozes have been suffering irretrievable losses. The technology and the pace of production are being disturbed, and there is a shortfall in the output of the most important types of products. For example, the output of

some nonferrous metallurgy enterprises fell short by millions of rubles for this reason in January of this year.

There are many reasons for deterioration in the work of the thermal power stations. However, the main factor is the lack of organization and lack of monitoring on the part of management and of the appropriate services of the enterprises and the power system, a slackening of the current work of the staff of the republic's Ministry of Power and Electrification, and extremely unsatisfactory preparation for and conduct of last year's repair drive. The matter has come to the point that 11 stations, among them the Ekibastuzskaya and Yermakovskaya GRES's, Pavlodarskaya TETs-1 and TETs-3, KarGRES-1 [Karaganda GRES No 1] and Petropavlovskaya TETs-2, whose share is more than half of all the power capacity, have not received certification of readiness to take the load. And it is not surprising that they are operating below their capabilities.

Further successes in developing the economy depend greatly upon how effectively power-engineering capacity is used. Because of this, party and soviet organs must undertake strong, unremitting monitoring of the work of each electric-power station and each central heating plant, increase exactingness on the managers of activities that permit disturbances in the customers' electrical supply, and motivate collectives to make maximum use of reserves within the production facility. It is necessary to change radically the work style and the management methods of the republic's Minenergo [Ministry of Power and Electrification]. It should become an authentic headquarters of the branch, execute constant monitoring, extend timely assistance, foresee difficulties, and know how to manipulate resources.

The express route for further strengthening the republic's power-engineering potential is acceleration of the introduction and assimilation of the Ekibastuz complex's capacity. The attention of party and economic organs to this most important portion of the work must be intensified. As rapidly as possible, the work of the 500,000-kw power units must be stabilized, the pace of construction and erection of the ordinary units of GRES-1 must be raised, and the schedule for erecting GRES-2 must be strictly observed.

Power-station operating reliability is governed by a high level of organization of production work, timely preventive maintenance, and keeping the equipment in an efficient condition. Timely provisioning of the station with all that is necessary is of no little importance. Meanwhile, liquid and solid fuel reserves were below the norms at the start of this year. A shortage of spare parts for the main and auxiliary equipment was experienced. The republic's Minenergo, Gossnab and the railroads' administrations have been called upon to take the most decisive measures to eliminate these deficiencies. At the same time, it is necessary to raise the role and increase the responsibility of the operational services of power-system enterprises, to improve the management of production work, to perform precise, accident-free work, and to carry out unswervingly the established regimes and schedules for the release of electricity to customers.

It is people who put any plan into practice. Only well-organized labor at each workplace, strong discipline and high responsibility on the part of the performers of the assigned tasks will bring the desired success. Based upon this, party, trade-union and Komsomol organizations of power-system enterprise collectives are obligated to activate large-scale political and educational work among the workers, to insure that socialist competition is better publicized and is made more

effective, to explain to each worker the missions and tasks that face the brigade, the shift, and the enterprise as a whole, to be more active in putting individual and collective experience into practice when organizing the drive to increase production effectiveness, and to see to it that work proceeds without lags. A new system for material incentives for the generation of electricity has now been introduced. Party organizations and economic supervisors of power-engineering enterprises should use more fully the opportunities presented to them to develop the labor activeness of collectives.

Experience indicates that real success comes when people evaluate the results of their work self-critically, are able to envision the long term, and live not just for today but also for tomorrow. Therefore, right now, each enterprise of the branch and Minenergo should, while also strengthening the drive to stabilize the economy's power supply, promote earnest work as soon as possible to prepare for the new repair drive, which is not far off. Each enterprise must have a specific plan for conducting it. All resources must be stipulated ahead of time and the contemplated measures must be conducted by the established deadlines and with high quality.

It is a matter of honor for Kazakhstan's power workers to carry out the socialist commitments that have been adopted for the second year of the 11th Five-Year Plan and to insure the reliable, uninterrupted operation of all branches of the republic's economy.

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